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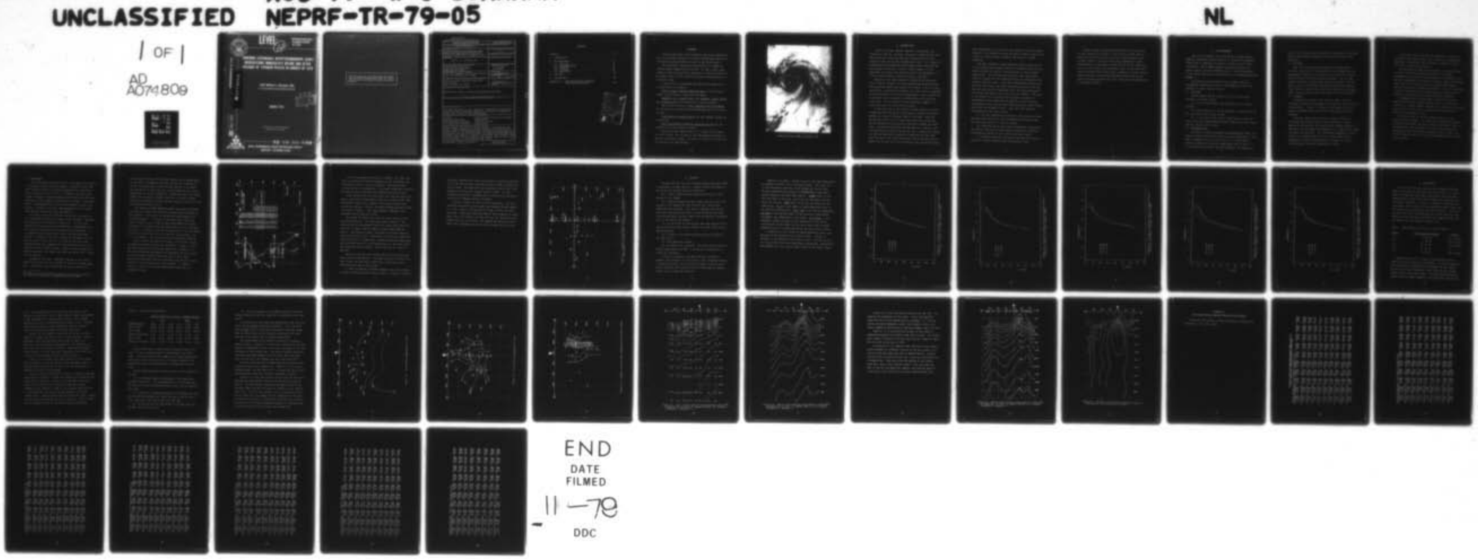

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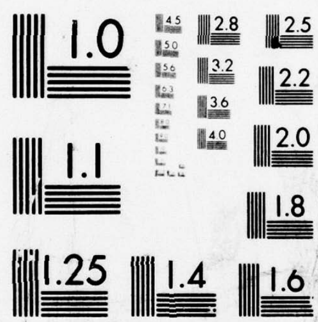

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TR 79-05

AIRBORNE EXPENDABLE BATHYTHERMOGRAPH (AXBT) OBSERVATIONS IMMEDIATELY BEFORE AND AFTER PASSAGE OF TYPHOON PHYLLIS IN AUGUST OF 1975

CAPT William G. Schramm, USN

Naval Environmental Prediction Research Facility

AUGUST 1979

NAVAL ENVIRONMENTAL PREDICTION RESEARCH FACILITY
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18. SUPPLEMENTARY NOTES

The work described in this report was conducted in conjunction with the author's doctoral program at the Naval Postgraduate School and is part of the dissertation.

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Air-sea interaction	Ocean mixing
Ocean thermal structure	Tropical cyclone
Air-ocean heat exchange	Mixed layer

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Ocean thermal response to a major typhoon is analyzed on the basis of data collected during the passage of Typhoon PHYLLIS in August 1975 in the Philippine Sea. This unique set of data was collected using calibrated Airborne Expendable Bathythermographs dropped from a Navy P-3 aircraft. There were three flights: the first was made 14 hours before storm passage, the second 10 hours after passage, and the third two days later.

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CONTENTS

FOREWORD

The work described in this technical report was conducted as part of my doctoral studies at the Naval Postgraduate School and the material contained herein is part of the dissertation.

This experiment required the interaction of a number of different Navy commands and activities. As such it was a good example of how the operational experience of a Naval Officer can be a major factor in the successful planning and execution of a scientific study.

I would like to acknowledge the support and cooperation I received from the following:

Office of Naval Research (ONR Code 480) for the financial support and assistance in obtaining the AXBTs.

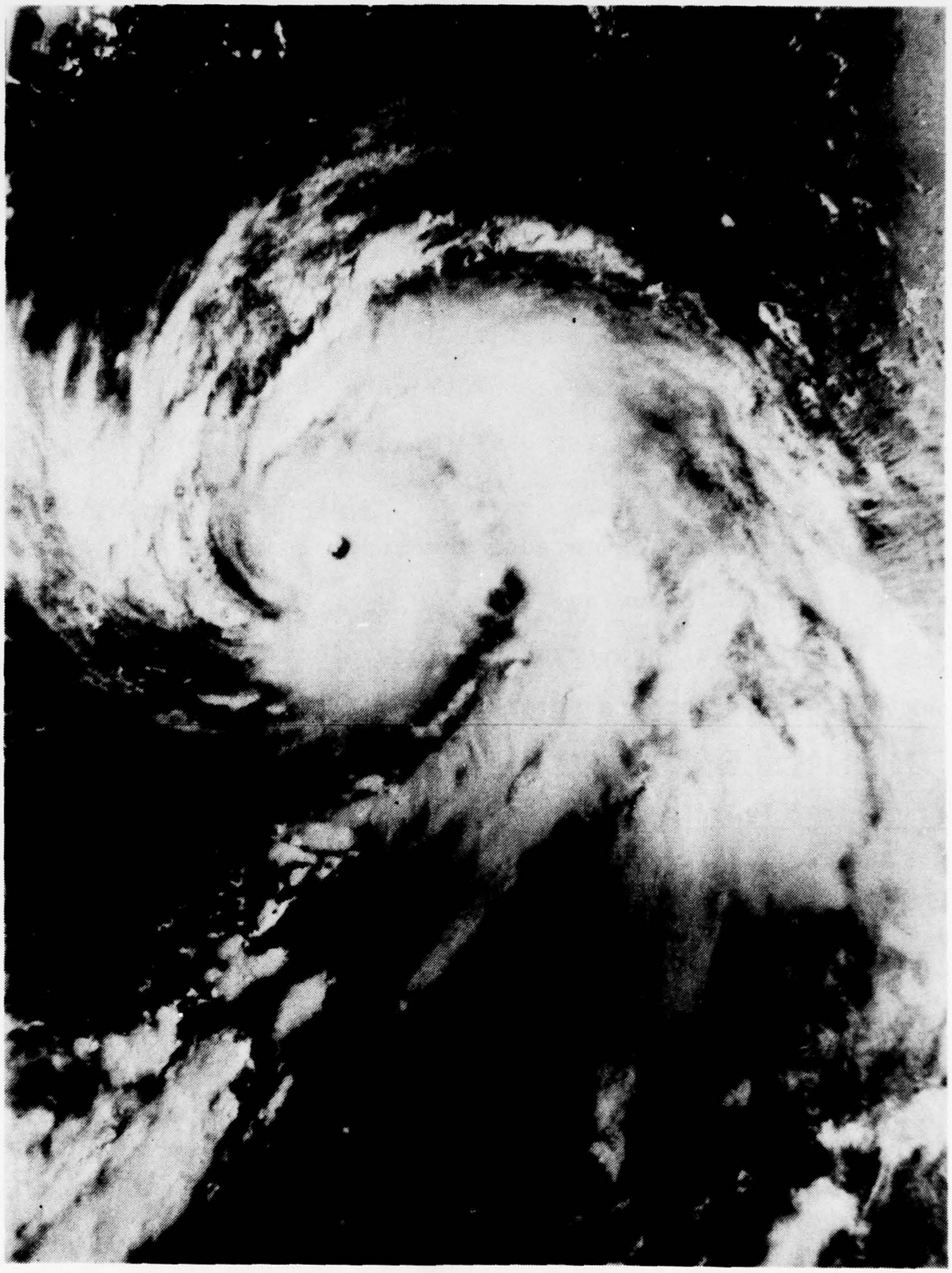
Commander, U.S. Seventh Fleet, and Commander, Patrol Forces, U.S. Seventh Fleet for providing the P3 aircraft assets.

The officers and men of Patrol Squadron Sixty Five (VP65) for doing such an outstanding and professional job of flying the missions.

Fleet Numerical Weather Central for the computer processing of the data.

Naval Environmental Prediction Research Facility for the preparation of this technical report.

Finally and most importantly of all I would like to thank Dr. Dale Leipper, the chairman of the Oceanography Department at NPS and my doctoral advisor, for both his scientific insight and his patience and understanding.



TYPHOON PHYLLIS, 2302Z, 14 AUGUST 1975

1. INTRODUCTION

Tropical cyclones, whether typhoons or hurricanes, are creatures of the sea. We know, from years of observations, that these warm-core storms are born over the warm waters of the tropical oceans and rapidly dissipate over land. It is generally accepted that the energy that fuels these storms comes from the heat content of the sea. Little is known, however, of the magnitude of the heat flow from the ocean to the atmosphere, or of the residual effect of this heat loss on the ocean.

Because of the large amounts of precipitation associated with a tropical cyclone, it can be assumed that evaporation and the associated latent heat transfer are factors in the air-ocean interaction. Sensible heat transfer is a factor that is dependent on the difference in air and sea temperatures. Heat transfer due to radiation can be assumed to be negligible due to the heavy cloud cover. The net result of these processes, however, is a significant heat loss from the sea surface.

At the same time as the surface is being cooled, it may be assumed that the high winds of the tropical cyclone are causing mechanical mixing of the upper layer of the ocean. Both the surface heat loss, with its associated convective overturning, and the mechanical mixing could be expected to deepen the mixed layer. Scattered observations through the years, however, have indicated that this was not always the case. Leipper has pointed out that the additional processes of upwelling may take place under the path of the tropical cyclone, bringing colder water up towards the surface and in fact displacing the thermocline upward.

Other researchers, such as Black, have theorized that the upward movement of the thermocline under the path of these storms is due in part to internal waves created by the tropical cyclones themselves.

The major problem in identifying the effects of the various air-sea interaction processes and their resultant effects on the oceans has been the sparse, scattered nature of the available observations. This has been the case for a very good reason. Tropical cyclones are very dangerous storms and responsible ship captains stay well clear. Since most oceanographic observations are taken from ships, the result has been that most of the few reports we do have were taken days after the storms had passed and allowed the ships to visit the areas of interest. The study of the effects of Hurricane Hilda by Leipper is generally considered the most authoritative analysis of post-hurricane oceanographic data, and yet these observations were taken several days after the passage of Hilda. There are three possible shortcomings in this type of data:

(1) Air-sea interactions unrelated to the tropical cyclone may take place during the time lag between the passage of the storm and the arrival of a ship on station.

(2) Advection due to major ocean circulations unrelated to the tropical cyclone may shift layers of water into different relationships relative to the storm and to other layers.

(3) Unstable conditions created by the storm will tend to return to a stable condition with the passage of time.

Another problem in determining the effects of the various air-sea interaction processes is the lack of reliable data to establish the initial conditions prior to the passage of the tropical cyclone. Previous studies have depended on random observations or climatology to establish the initial conditions. As far as this author could determine, prior to 1975 there had been no planned study of the ocean's response to a major tropical cyclone that had included detailed observations prior to the storm's passage along with near real time post-storm observations at the same locations.

2. THE EXPERIMENT

Over the past several years, the Office of Naval Research (ONR) has sponsored research projects at the Naval Postgraduate School (NPS) in Monterey, California, in the field of air/sea interaction. One of these projects has been the Oceans and Severe Tropical Cyclones (OSTROC) project. The work described in this report was part of that project and is designated Operation OSTROC 75.

The objective of the operation was to obtain detailed oceanographic observations prior to and immediately after the passage of a major tropical cyclone.

2.1 LOCATION

The Philippine Sea was chosen as the site for the data collection for three reasons:

(1) It is an area with a high incidence rate of tropical cyclones.

(2) Ocean advection is minimal compared to regions like the Gulf of Mexico with its loop current.

(3) It is close to the island of Guam, which is both the site of the Joint Typhoon Warning Center (JTWC) and an operational base for Navy P3 patrol planes.

2.2 INSTRUMENTATION

The SSQ-36, airborne expendable bathythermograph (AXBT), was chosen to obtain the desired thermal structure measurements. The AXBT is dropped from an aircraft; once it is in the water, a thermistor deploys and measures temperatures down to 1000 ft. As the thermistor descends, the AXBT telemeters the temperature

back to the aircraft, where the signal is displayed on a recorder. Depth is determined by elapsed time and the sink rate of the thermistor.

2.3 PLATFORM

Navy P-3 patrol planes were chosen as the measurement platform. Very early in the planning, it was decided that the measurements would have to be taken from an aircraft in order to obtain the near-real-time observations needed. The P-3 then became the logical choice because they are equipped to use the AXBT as part of their normal ASW mission and the Navy deploys these planes to several bases near the Philippine Sea including Guam. The only question was, would fleet P-3's be available?

2.4 PLANNING

Preparations started in the spring of 1974. The first action was to obtain a commitment to use Navy P-3 aircraft during the experiment. In May, I traveled to the Western Pacific to present the OSTROC operational plan to the appropriate fleet personnel.

The ocean thermal structure has a strong influence on underwater acoustics and thus on the performance of sonars. Because of the possible application of the planned research to ASW tactics and strategy, the Commander, U.S. Seventh Fleet agreed to support the operation. His subordinate commander for Patrol Forces, U.S. Seventh Fleet (CTF-72) in turn tasked the P-3 detachment in Guam to provide three P-3 flights on a not-to-interfere basis relative to operational flights.

The initial plan called for the experiment to take place during the 1974 typhoon season, but it had to be postponed one year when a problem with the procurement of AXBTs restricted their use to operational missions.

By the spring of 1975, the procurement situation had been corrected and 96 SSQ-36 AXBTs were obtained for OSTROC. Arrangements were made for the instruments to be shipped to the National Oceanographic Instrumentation Center (NOIC) in San Diego, where they were calibrated using the technique developed by Sessions and Barnett for NORPAX experiments. Eleven of the buoys failed the calibration test and the remaining 85 were marked, numbered, and shipped to Guam where they were stockpiled.

Arrangements had also been made in 1974 with the Fleet Weather Central/Joint Typhoon Warning Center to provide early warning of a suitable typhoon (defined as a typhoon with sustained winds of over 100 kt) and to coordinate activities with the patrol wing detachment in Guam.

With the arrival of the 1975 typhoon season, all the preplanning was complete. The AXBTs were stockpiled and ready, the patrol plane crews had been briefed on the general nature of the experiment, the buoy pattern for the initial flight was prepared and JTWC watchstanders had been briefed on their role. All that remained was for me to wait in Monterey for the "right" storm to occur.

2.5 OPERATIONS

The 1975 typhoon season got off to a slow start, but finally in mid-August events started to happen. At 0242Z* on the 12th, JTWC issued warning #1 for tropical depression #7, with 30 kt winds located at 12.7°N, 137.9°E. At 0304Z on the 12th, JTWC issued a prognostic reasoning message that stated that TD 07 was expected to reach typhoon intensity within 72 hours. LCDR Ralph Miller, Oceanography Officer at the Fleet Weather Central, was alerted. At 0540 on the 12th, JTWC upgraded TD 07 to Tropical Storm PHYLLIS based on aircraft observations.

By 1224Z on the 12th, JTWC had revised their estimate and now stated PHYLLIS would be a typhoon within 48 hours. Movement was expected to the northwest at about 8 kt. At this time, LCDR Miller called me and also alerted the P-3 detachment that this might be the storm to be examined for the experiment. It was determined that there were no conflicts with operational missions. By 0824Z on the 13th, PHYLLIS had increased to 65 kt and was now at 14.5°N, 135.1°E. At 1734Z on the 13th, JTWC upgraded PHYLLIS to a typhoon with sustained winds of 85 kt and predicted further intensification. Based on this information, I made the decision to go ahead, and VP-65 was alerted for a flight the next morning.

At 0040Z on the 14th, I departed Monterey for Guam and at 0200Z the same day, the first OSTROC P-3 took off from NAS Agana, Guam. LCDR Miller was on board with the latest satellite fix

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*Because of the time difference between Guam and the mainland, all times are referenced to Greenwich mean time (GMT).

on the storm to help orient the buoy pattern to be dropped ahead of the storm. By 0600Z on the 14th, PHYLLIS had increased to 100 kt of sustained wind and was moving north at 15 kt toward the area where, at that time, our P-3 was obtaining the critical observations of initial conditions. By the time the first flight (AA141) had returned at 141330Z, after an 11 1/2 hour flight, PHYLLIS had increased to 110 kt and was located at 21.6°N, 137.0°E and continuing north at 18 kt.

The pattern of AXBTs dropped by AA141 consisted of 25 buoys starting at 23°-20°N, 138°-50°E and curving counterclockwise to the southwest. Thirty-four of the SSQ-36's were dropped, and 25 worked properly. I arrived in Guam three hours after the return of AA141, just in time to learn that PHYLLIS had indeed crossed over the pattern with sustained winds of 115 kt and gusts to 140 kt. The radius of the 100 kt winds was 25 n mi; the radius of the 50 kt winds was 125 n mi to the east and northeast, and 75 n mi elsewhere. Sea level pressure was estimated at 920 mb.

Later, PHYLLIS continued on to Japan, striking the islands of Honshu and Shikoku and killing 19 persons. Figure 2.1 shows the path of PHYLLIS with each dot equating to a synoptic fix. The area enclosed by the dashed line represents the area covered by the horizontal analyses discussed later in this report. Section A-B represents that line along which the vertical cross-sections, also discussed later, were analyzed. As shown in Figure 2.1, PHYLLIS crossed the AXBT pattern about 780 n mi northwest of Guam.

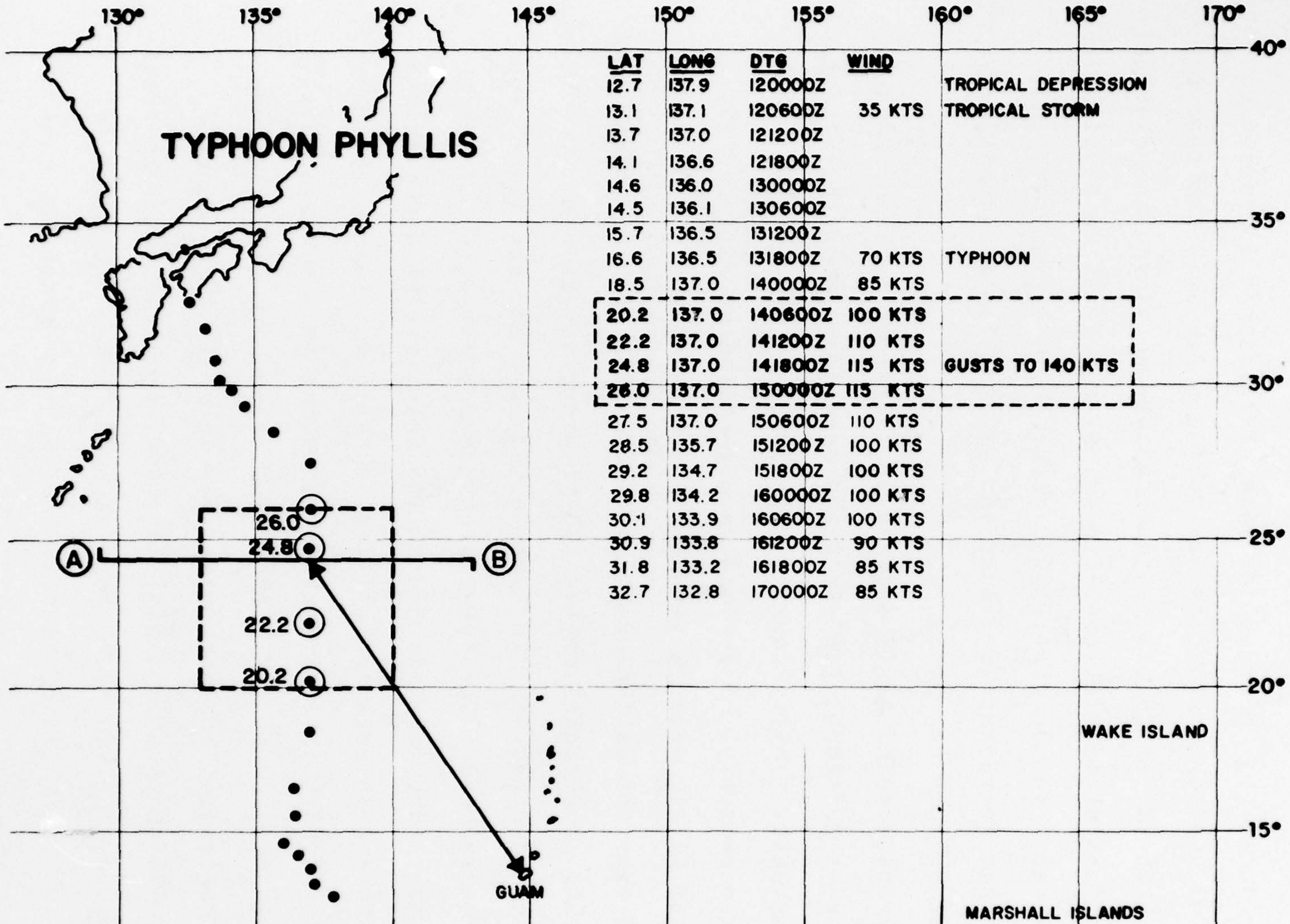

Figure 2.1. Track of Typhoon PHYLLIS.

So far, the operation had gone as planned. The JTWC forecasts for PHYLLIS had been outstanding and the instruments had functioned as well as could be expected. Now came the most critical phase of the operation: the second flight had to revisit the area as soon as possible after PHYLLIS cleared the area.

After worrying over all the things that could go wrong, but didn't, the second flight (AA151) took off at 0415Z on the 15th. We headed to that point northwest of Guam where PHYLLIS had crossed our pattern. Enroute, we passed through the major feeder band south of PHYLLIS. The cloud patterns resembled a well-developed mid-latitude cold front.

We arrived on station just 10 hours after the eye of the storm had passed by. The timing was close to perfect. The surface wind varied between 45 and 20 kt during the flight and there was a broken layer of cumulus clouds between 2000 and 5000 ft. We dropped 27 AXBTs, including 10 at points measured during the earlier flight. These were the 10 points nearest the track of PHYLLIS. An additional 14 observations were made along the lines both parallel to and perpendicular to the storm track, and there were three failures. This flight was 10.1 hours in duration.

Two days later the third flight (AA171) revisited the same area, taking 23 observations. The same 10 points visited on the first flight and revisited on AA151 were visited once again. Three AXBTs were bad on this flight.

In total, 85 SSQ-36's had been dropped on the three flights; of these, 72 were good and 13 were failures. Of the 72, 67 were

correctly recorded and 5 were lost because of recording problems. All of the data had been recorded on two in-flight recorders and also on tape. The tapes were later processed using a Fast-Time Analyzer at the Tactical Support Center on Guam. All the recording and analysis equipment was of high quality and used by the Navy for frequency analysis purposes.

Figure 2.2 shows the area of the investigation. The dots represent the points at which AXBTs were dropped and the numbers 1, 2, and 3 refer to the particular flight on which the drops were made. Additional drops were made to the southwest on flight AA141 (the first flight), but they were too far removed from the typhoon track to be of value. The typhoon was moving due north along 137°E longitude during the time it passed over this area.

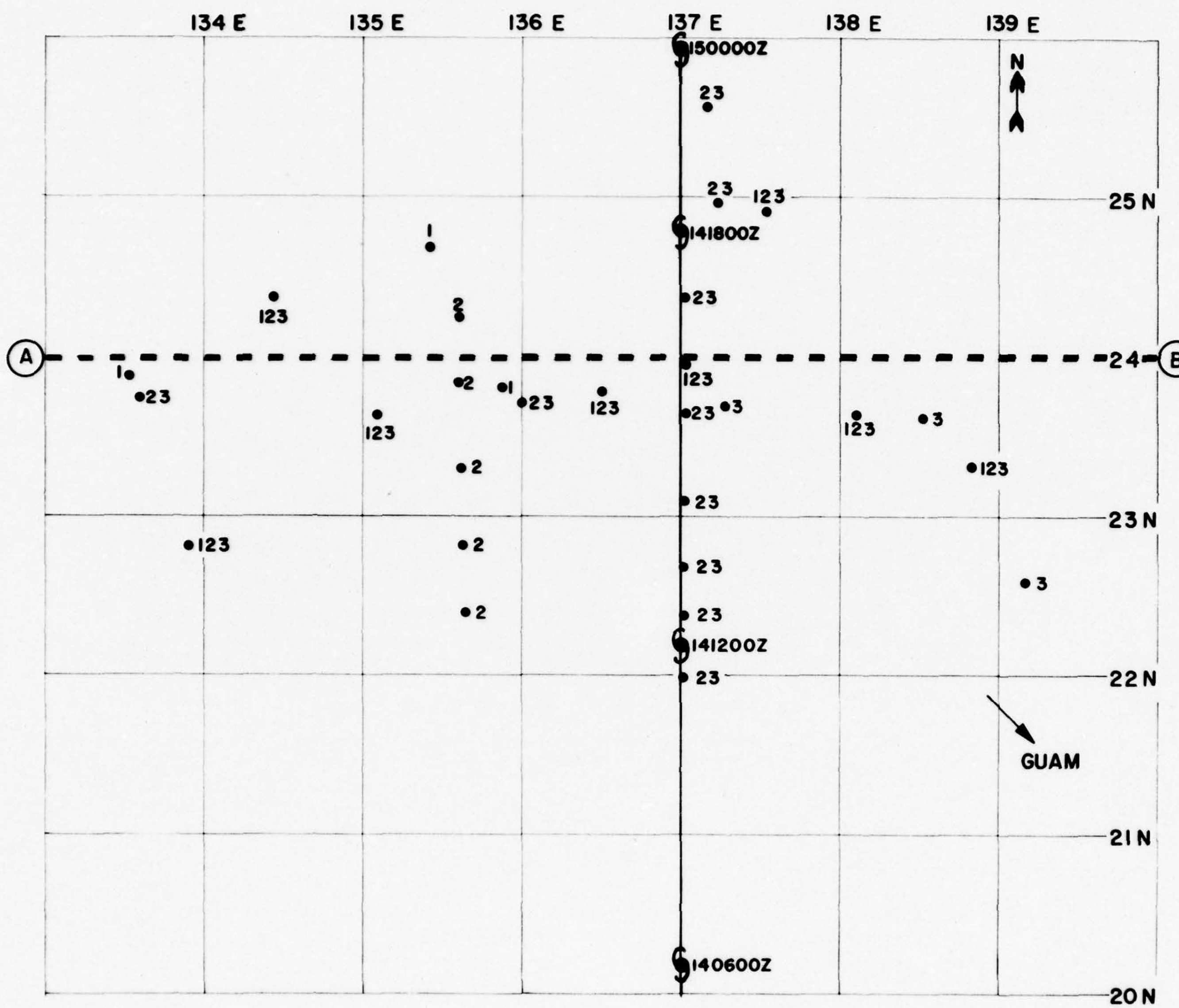

Figure 2.2. Locations of AXBT observations: 1 - observations on 14th; 2 - observations on 15th; and 3 - observations on 17th.

3. THE DATA

Without question, the data collected during Operation OSTROC 75 represents a unique data set. Several factors contribute to the unique and valuable nature of this data:

(1) Initial conditions were observed just prior to the passage of the typhoon.

(2) Reaction observations were taken just hours after the passage of the typhoon and just 24 hours after the initial conditions were observed. This factor, combined with the fact that the investigation took place in the Philippine Sea, away from land and major currents, meant that the measured differences were in fact due to the typhoon.

(3) The third set of observations gave some measure of the rate at which the ocean returns towards its normal state after a typhoon passage.

(4) A number of the observations were actually taken at the same points.

(5) The typhoon was intense.

(6) The AXBTs were calibrated. This last factor cannot be overstressed because the AXBT is not factory calibrated as a scientific instrument.

As noted in Section 2, the AXBT data were recorded on magnetic tape recorders in the aircraft, later processed through a frequency analyzer, and the results plotted as analog traces. These traces were then digitized at the Fleet Numerical Weather Central using a CALMA 408 digitizer.

Appendix A provides a listing of each of the AXBT observations as produced from the file of digitized records. The first line in each observation consists of the appropriate station data. The ship name V026 was assigned at FLENUMWEACEN to keep these records separate from other AXBT reports. YYMMDD refers to the last two digits of the year, two digits for the month, and two digits for the day. HHMM refers to the hour and minute of the observation. No. Pr is the number of depth-temperature pairs in the particular observation. Surf. Temp is the surface temperature. Max Depth is the maximum depth for the particular observations and Temp is the temperature at that depth. Print Count is the sequential number assigned to each observation in the series. Following the station data line are one or more lines of depth-temperature pairs as determined during the digitization process.

In addition to the listings of depth-temperature pairs, each observation was plotted using a Varian plotter. Figures 3.1 through 3.5 are examples of this type of plot. In these particular figures there are three observations overplotted, representing measurements at a given point, made on each of the three flights.

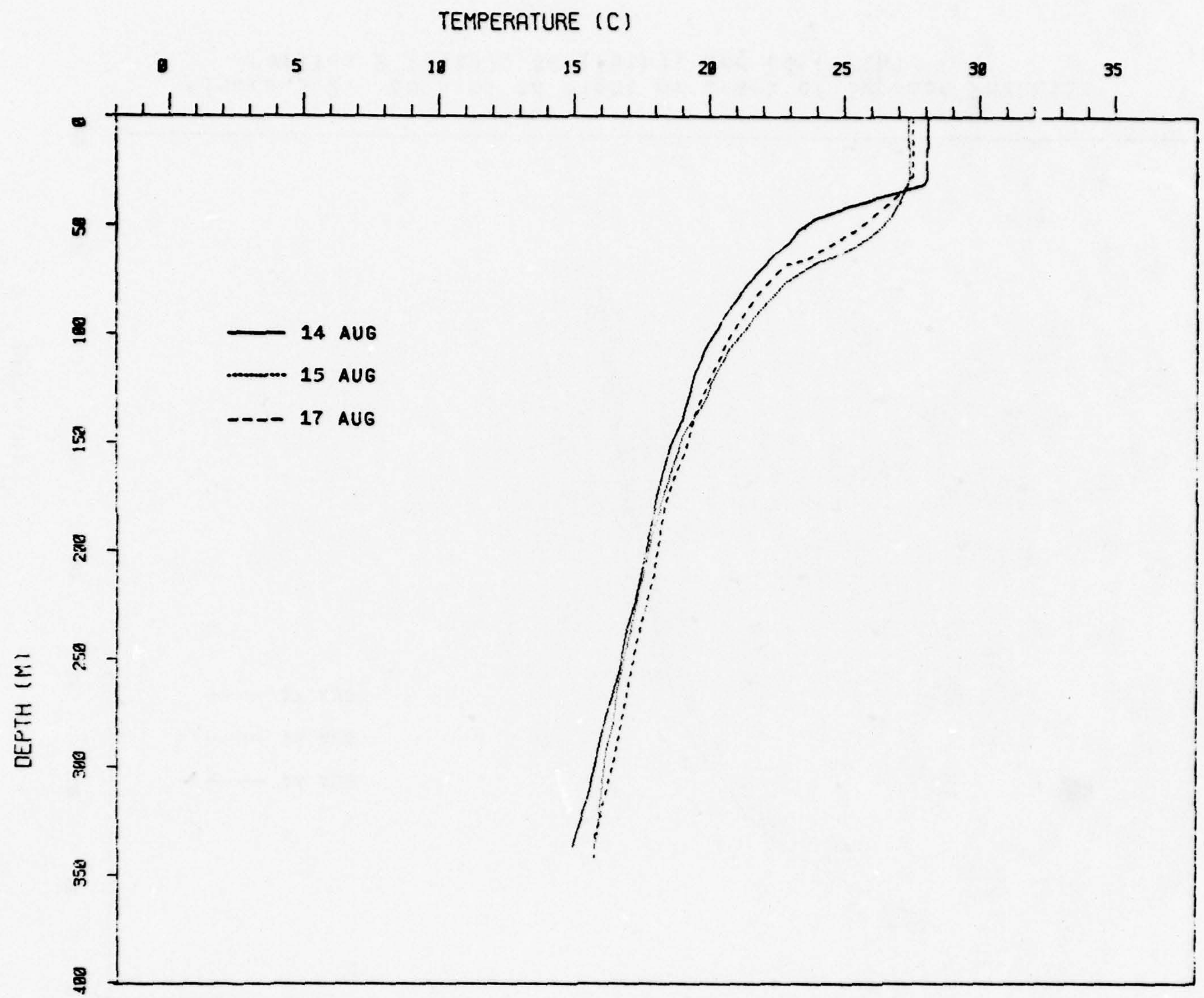

Figure 3.1. 110 n mi to right of track of Typhoon PHYLLIS: Profiles 1 (14th), 33 (15th), and 66 (17th).

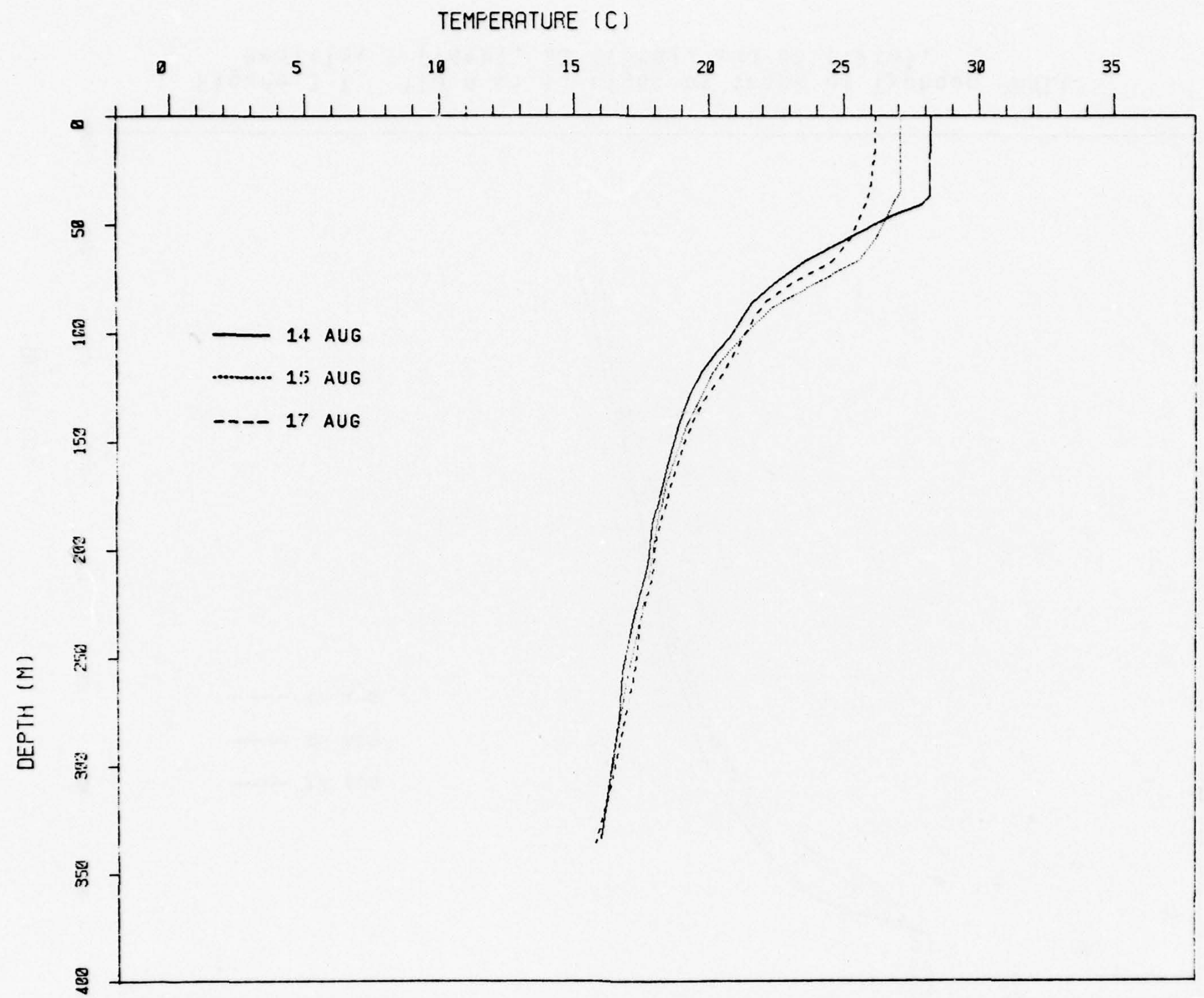

Figure 3.2. 60 n mi to right of track of Typhoon PHYLLIS: Profiles 2 (14th), 34 (15th), and 64 (17th).

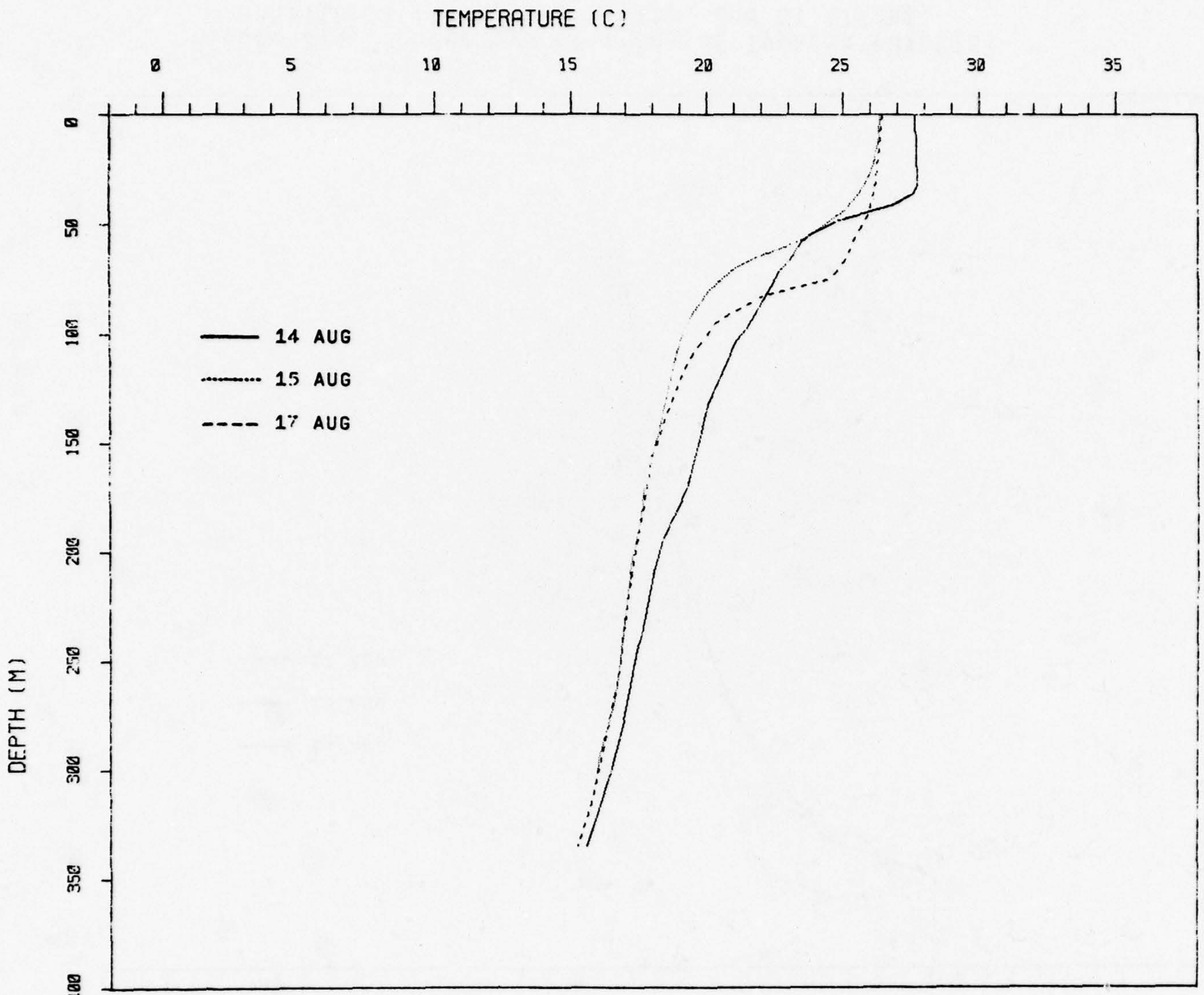

Figure 3.3. 30 n mi to right of track of Typhoon PHYLLIS: Profiles 22 (14th), 32 (15th), and 53 (17th).

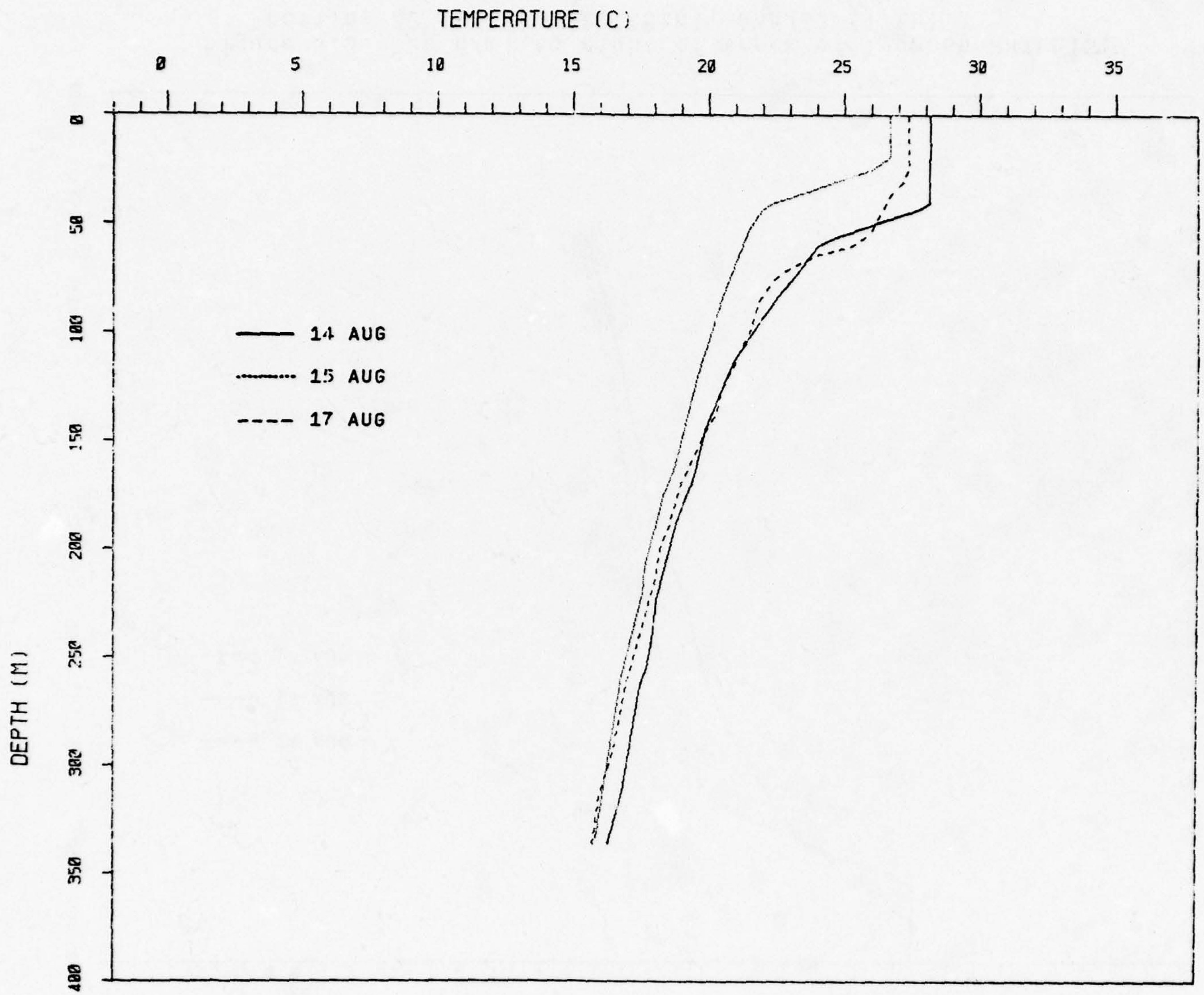

Figure 3.4. Under eye of track of Typhoon PHYLLIS: Profiles 3 (14th), 35 (15th), and 51 (17th).

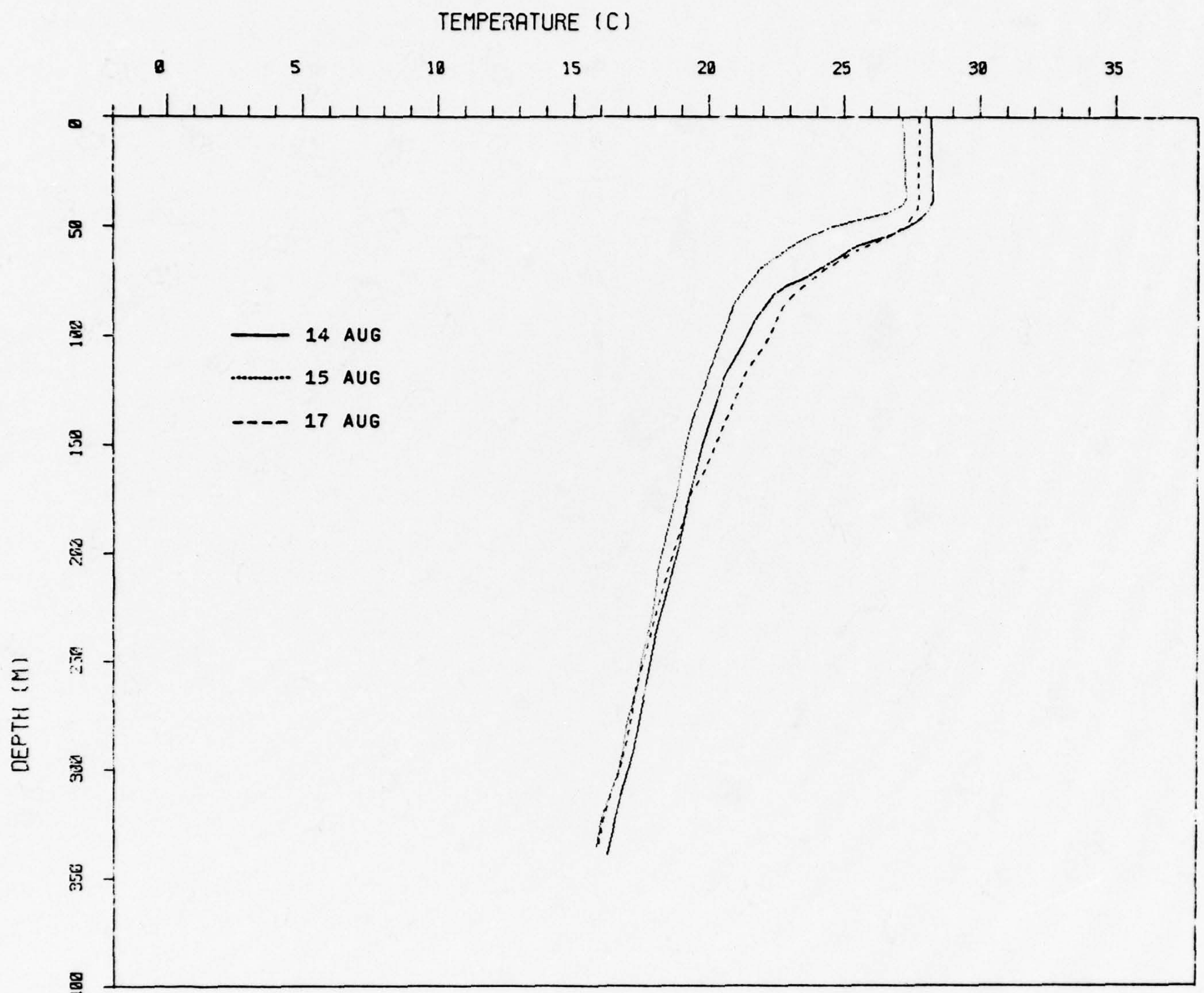

Figure 3.5. 30 n mi to left of track of Typhoon PHYLLIS:
Profiles 4 (14th), 36 (15th), and 60 (17th).

4. THE ANALYSIS

The first phase in the analysis was to compare individual BATHY traces taken on the before and after flights. To facilitate this comparison those BATHY observations that were made common points on each of the three flights were identified and the traces overplotted. Figures 3.1 through 3.5 represent six such cases. Table 1 shows the relationship of each of these sets of observations to the track of the eye of PHYLLIS. In each of the plots the solid line represents the initial condition, the dotted line the condition right after the typhoon passage, and the dashed line the condition two days later.

Table 1. AXBT positions relative to track of PHYLLIS.

Figure	AXBT Sequential Numbers	Distance
3.1	1, 33, 66	110 n mi east
3.2	2, 34, 64	65 n mi east
3.3	22, 32, 53	30 n mi east
3.4	3, 35, 51	0
3.5	4, 36, 60	30 n mi west

Observations 3, 35, 51 (Figure 3.4) were taken directly under the track of the eye of the typhoon. As would be expected this was the set of observations that showed the most change. The SST at this point decreased 1.49°C, which was the largest change noted on the second flight. The most surprising change, however, was the upward movement of the thermocline from 40 m to

18 m. This shallowing of the mixed layer took place in the presence of winds over 115 kt. Note also the upward displacement of the isotherms at all depths down to 330 m. This movement appears to be fairly uniform and on the order of 50 m. Two days later there has been a slight increase in SST and a general return of the profile towards the initial conditions.

Thirty n mi to the west of the track of the eye the same pattern of changes took place, but to a lesser degree. The SST decreased 1.28°C and the mixed layer stayed at about 39 m. There was a definite upward displacement of the isotherms, but this time only on the order of 20-30 m. Once again the observation taken on the 17th indicated a warming at the surface and a return of the isotherms to their original levels.

Sixty n mi to the west there was relatively little change. Note in Figures 3.4 and 3.5 how well mixed the upper layer is, and how sharp a break exists at the top of the thermocline as observed right after storm passage.

East (or right) of the track of PHYLLIS is where the maximum winds would be expected, and here the changes were different from those noted to the west. Thirty n mi to the east the surface cooled 1.28°C and once again there was a generally upward movement of the isotherm. Sixty n mi to the east there was only a 1.15°C decrease, but by the 17th the decrease in SST had reached 2.04°C. Moving farther away from the storm track a change of just 0.58°C was observed 110 n mi to the east. Table 2 lists the SST changes for each of the points under consideration.

Table 2. Sea surface temperatures.

	Position Relative to Track of Typhoon PHYLLIS					
		East			West	
Distance (n mi)	110	65	30	0	30	60
SST on 14th	28.09	28.22	27.64	28.18	28.20	28.00
SST on 15th	27.38	27.07	26.36	26.69	27.16	28.00
Change (15th-14th)	-0.71	-1.15	-1.28	-1.49	-1.04	0.0
SST on 17th	27.51	26.18	26.44	27.48	27.76	28.04
Change (17th-14th)	-0.58	-2.04	-1.20	-0.80	-0.44	+0.04

Of particular note in those profiles obtained east of the track, is the ill-defined nature of the bottom of the mixed layer. This characteristic was common to all those observations taken east of the storm track and is in sharp contrast to the observations taken to the west where the mixed layer was well mixed.

Several observations may be made relative to the analysis of the data:

(1) A pronounced upward displacement of the subsurface isotherms took place. This displacement was at a maximum under the track of the eye and decreased both to the left and right of that track.

(2) There was a pronounced decrease of SST between the 14th and 15th with the maximum loss under the path of eye and with a lesser decrease in SST both to the left and right.

(3) By the 17th the SST had started to increase again to the west, but not to the east.

(4) After the passage of the typhoon the mixed layer was sharply defined to the left (west) but ill-defined to the right (east).

In reflecting on the latter two observations, two characteristics of the typhoon should be considered. First, the winds were stronger to the right (east) and second, the major feeder band for PHYLLIS was to the east and it persisted with winds over 50 kt for several days as PHYLLIS moved north.

The second phase of the analysis consisted of preparing analysis charts. Figure 4.1 is the SST as analyzed for the 14th, Figure 4.2 represents the SST on the 15th, and Figure 4.3 is the difference in the previous two. The zone of maximum change was oriented north-south between 137°E and 138°E, while the best track for the eye of the typhoon was due north along 137°E.

Vertical cross-sections of temperature were analyzed along section A-B, which was roughly 34°N. Figure 4.4 is the cross-section analysis for the 14th and it is evident that the initial conditions were those that could be considered as normal.

Figure 4.5 is the cross-section analysis for the 15th and is probably the most dramatic depiction of the changes caused by PHYLLIS. The most obvious change was the upward bulge in the isotherms under the path of the eye or slightly to the right of that track. At 137°E, for example, the 25° isotherm went from 54 m to about 30 m, but deeper the 20° isotherm went from 144 m to about 97 m and the 17° isotherm went from 295 m up to 248 m. Less obvious is the smaller downward movement of isotherms both to the east and west of the sharp zone of upwelling.

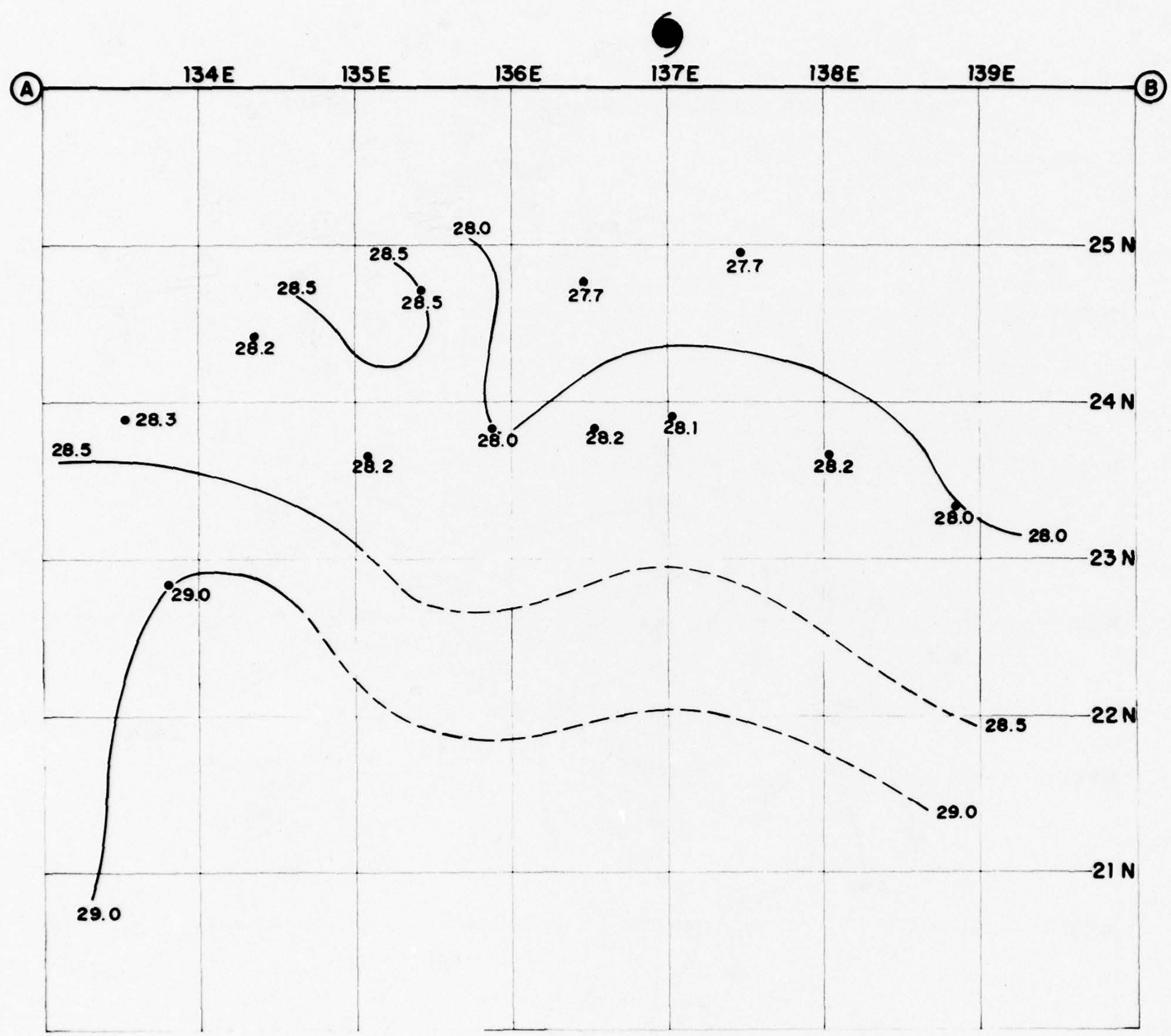

Figure 4.1. Sea surface temperature on 14th.

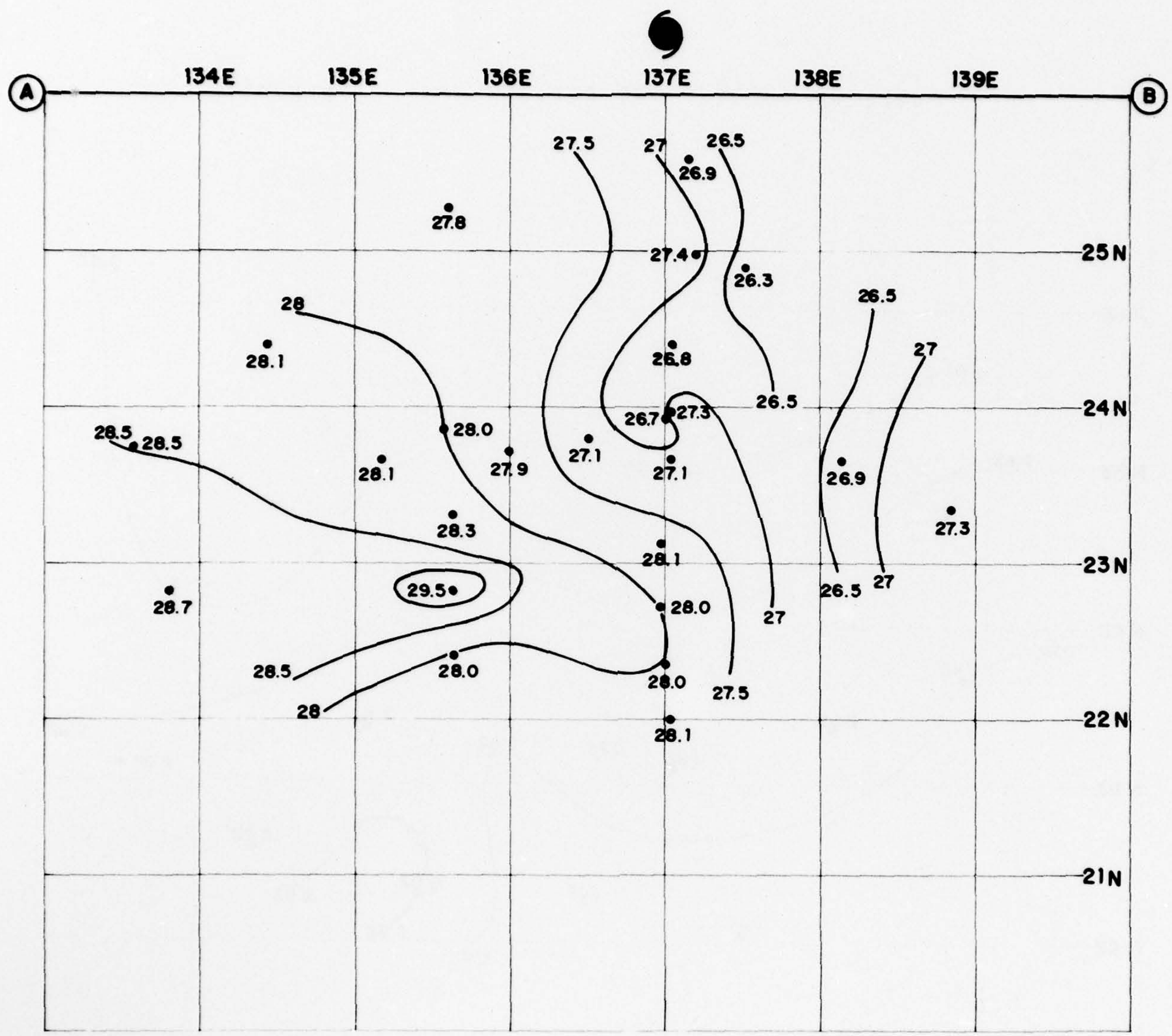

Figure 4.2. Sea surface temperature on 15th.

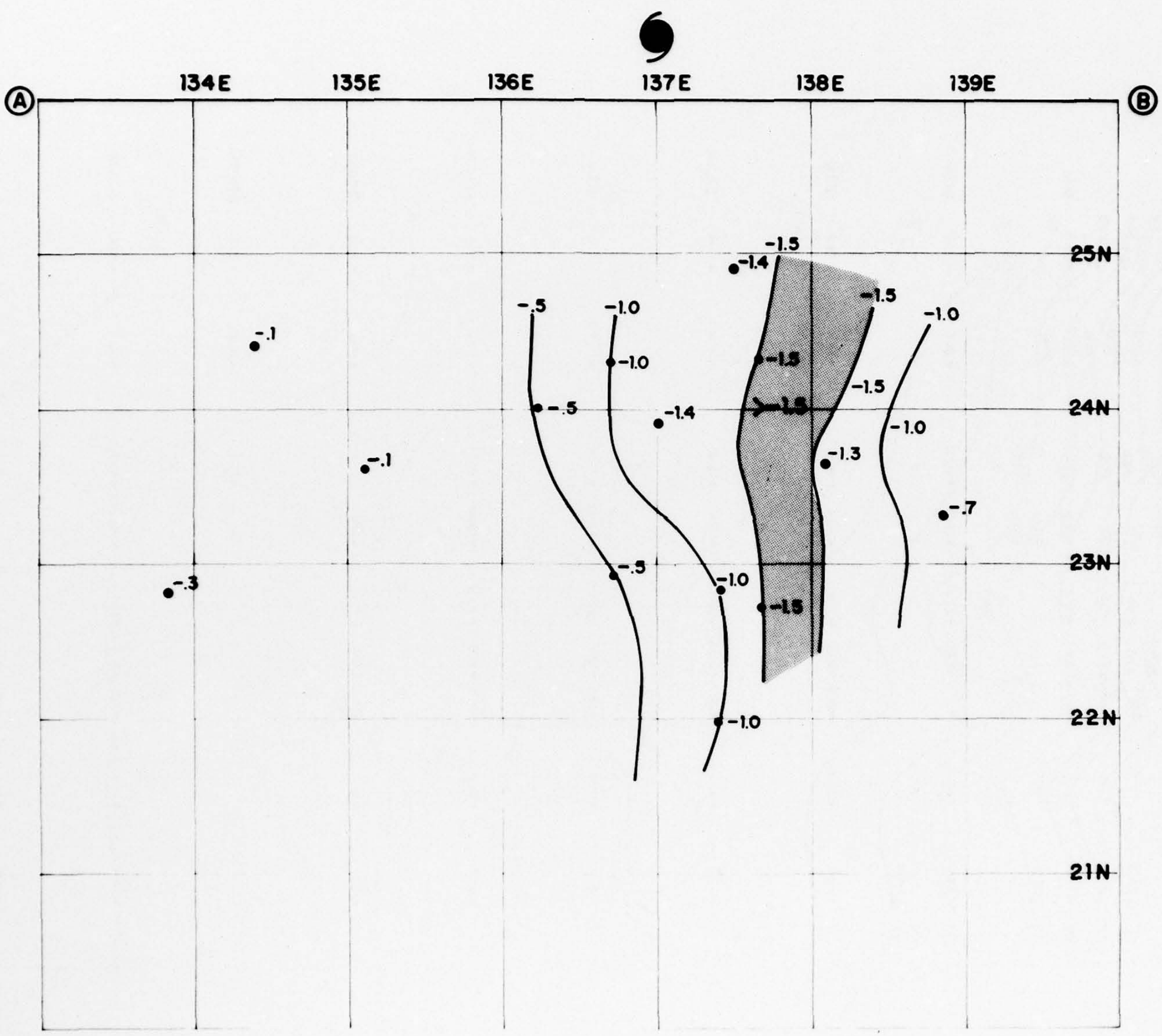

Figure 4.3. Changes in sea surface temperature from 14th to 15th.

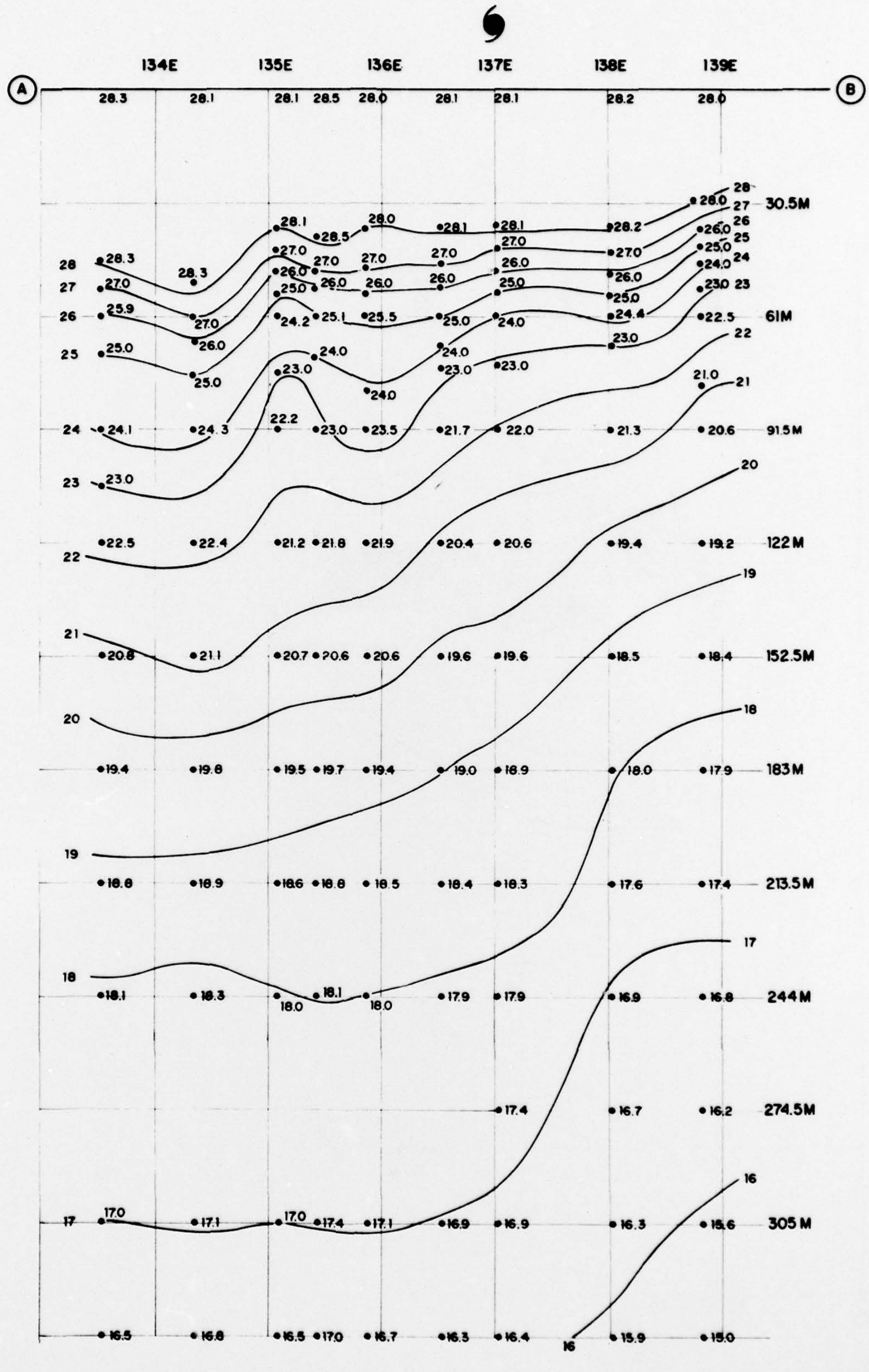

Figure 4.4. West to east vertical cross-section, along 24°N, perpendicular to track of Typhoon PHYLLIS, on 14 August. (Isotherms in degrees C.)

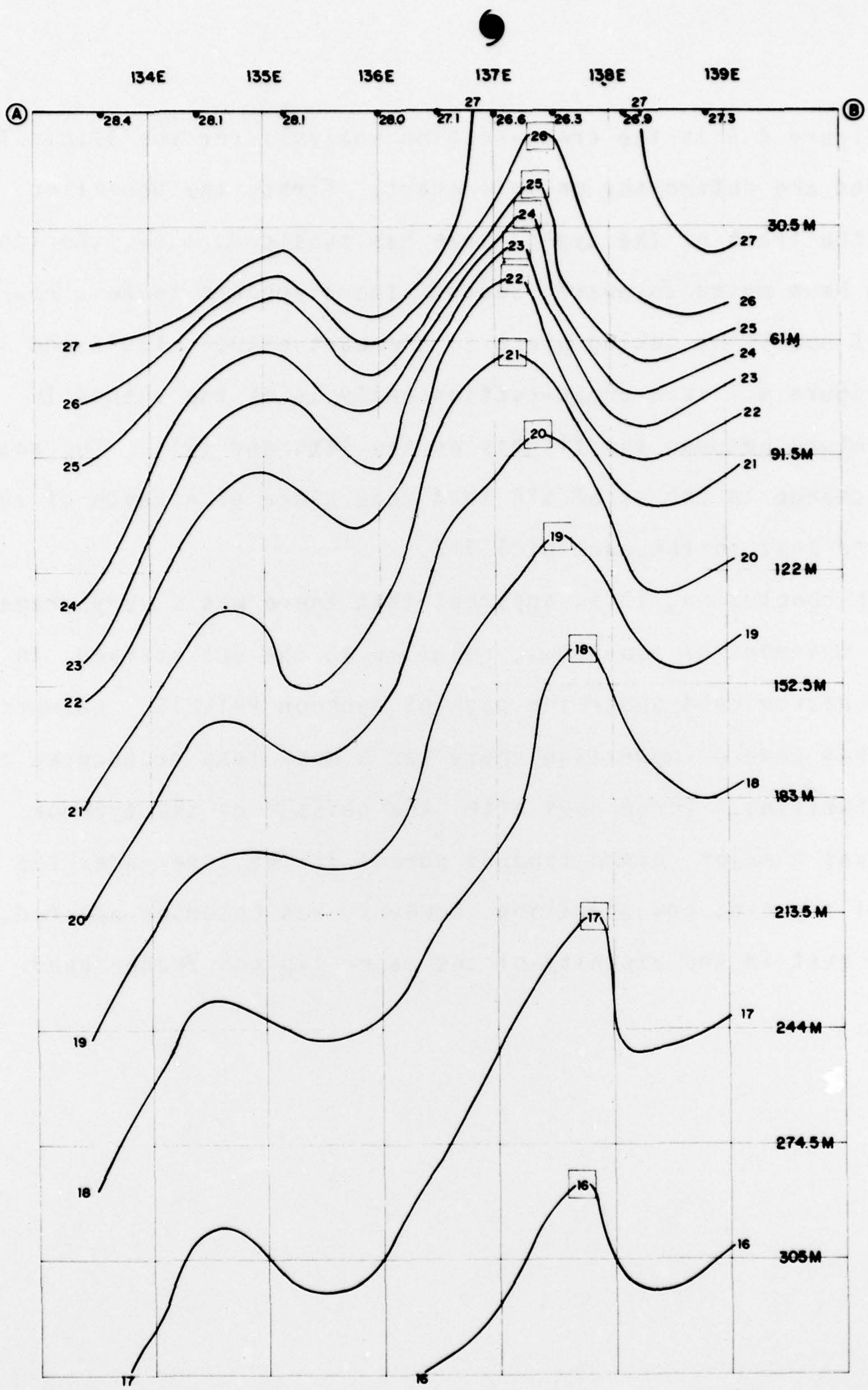

Figure 4.5. West to east vertical cross-section, along 24°N, perpendicular to track of Typhoon PHYLLIS, on 15 August. (Isotherms in degrees C.)

Figure 4.6 is the cross-section analysis for the 17th. Two features are noteworthy on this chart. First, the upwelling under the track of the typhoon eye has subsided, i.e., the isotherms have moved downward; second, there appears to be a new zone of upwelling taking place to the east between 138°E and 139°E.

Figure 4.7 is a cross-section analysis of the change in temperature between the flights on the 14th and 15th. The maximum was a change in excess of 5°C that took place at a depth of about 40 m and just to the east of 137°E.

In conclusion, it is apparent that there was a very dramatic upward movement of isotherms, relative to the sea surface, in a fairly narrow band under the path of Typhoon PHYLLIS. Outward from this zone of upwelling there was a much less pronounced zone of downwelling. Three days after the passage of the typhoon there was a major return towards normal in the zone under the path of the eye; new upwelling, however, was becoming apparent to the east in the vicinity of the major typhoon feeder band.

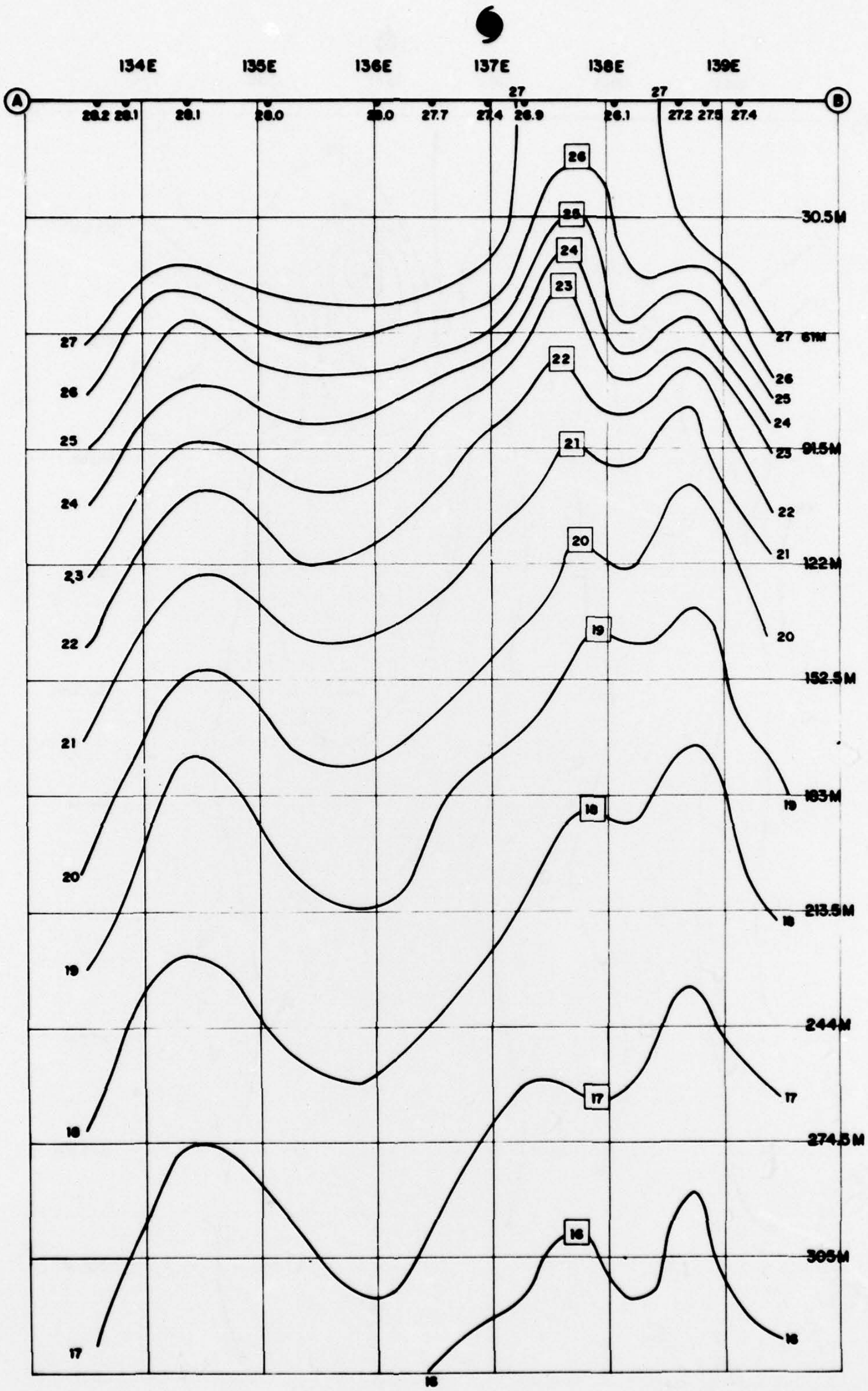

Figure 4.6. West to east vertical cross-section, along 24^{O}N, perpendicular to track of Typhoon PHYLLIS, on 17 August. (Isotherms in degrees C.)

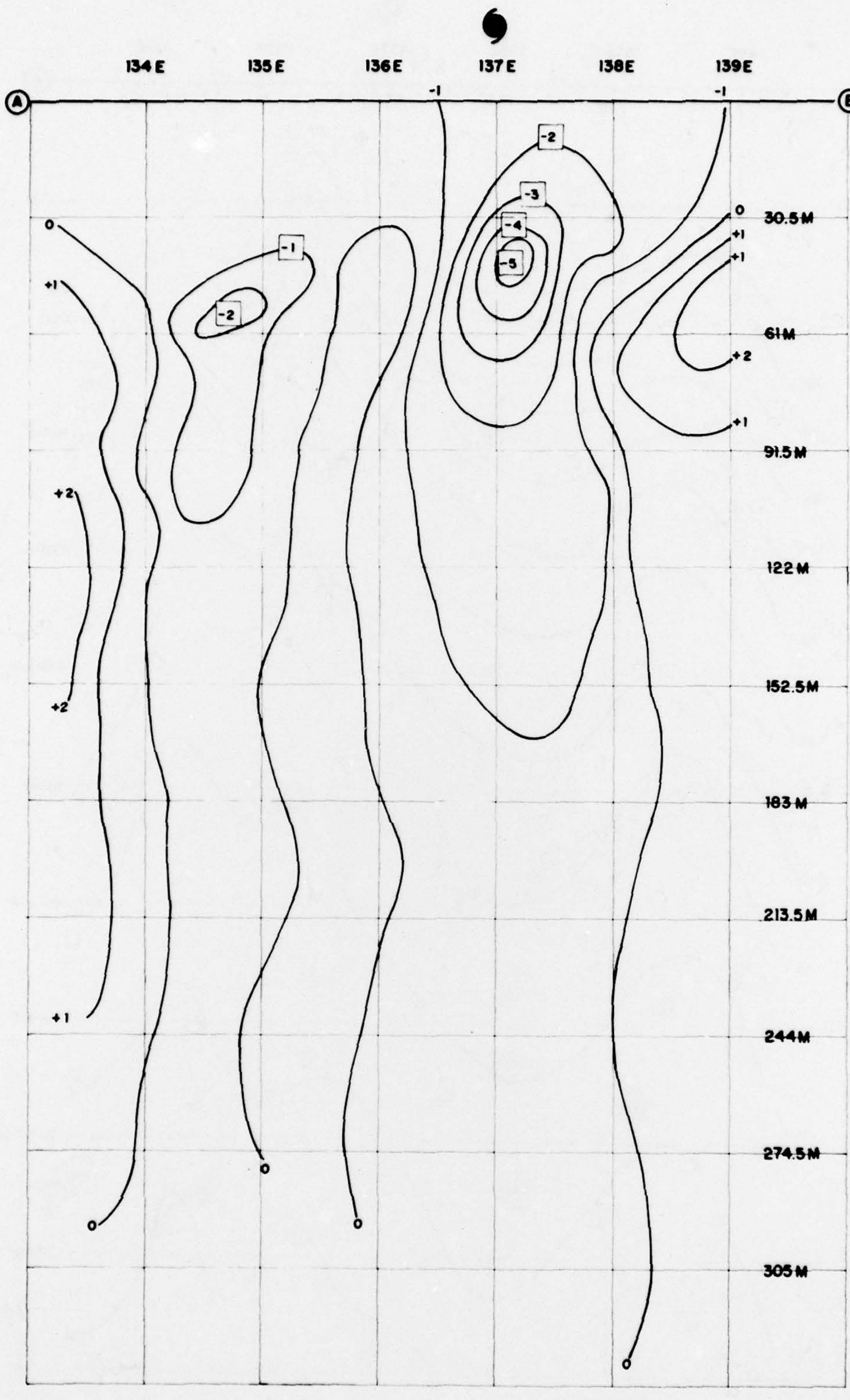

Figure 4.7. Vertical cross-section depicting changes in temperatures from the 14th to the 15th.

APPENDIX A

AXBT OBSERVATIONS PRODUCED FROM DIGITIZED RECORDS

Column and line entries on these listings are discussed and defined on p. 16 of this report.

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LISTING FROM XBT FILE AT FLEET NUMERICAL WEATHER CENTRAL, MONTEREY, CALIF. 93940
DEPTHS TO NEAREST METER.  TEMPERATURES IN HUNDRETHS OF DEGREES CELSIUS

SHIP YYMMDD HHMM LAMMM LOMMMM   NO.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750814 0456 2320N 13850E    21     2809      336 1492       1
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2809     28 2804     31 2793     41 2516     47 2387     52 2327     58 2293     63 2240     77 2137     90 2063
    105 1998    118 1946    138 1991    152 1852    172 1808    221 1728    238 1690    254 1670    282 1606    312 1552
    336 1492

V026 750814 0506 2340N 13802E    20     2822      333 1595       2
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2822     34 2818     37 2815     41 2786     46 2672     67 2350     77 2240     86 2157    102 2074    108 2027
    117 1974    128 1926    142 1883    163 1835    188 1790    206 1771    232 1715    256 1675    277 1665    333 1595

V026 750814 0519 2355N 13701E    20     2818      335 1634       3
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2818     40 2814     43 2777     49 2624     57 2443     60 2401     63 2380     73 2320     83 2253     97 2171
    113 2089    144 1985    167 1939    187 1881    222 1810    241 1791    254 1774    262 1749    311 1686    335 1634

V026 750814 0545 2350N 13632E    19     2820      338 1624       4
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2820     38 2824     43 2804     48 2763     54 2564     59 2543     74 2346     77 2283     81 2238     94 2159
    105 2117    118 2057    152 1969    182 1908    196 1890    237 1801    291 1722    307 1681    338 1624

V026 750814 0553 2350N 13552E    17     2800      335 1685       5
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2800     27 2805     40 2802     43 2793     61 2575     64 2535     70 2496     75 2474    100 2320    125 2197
    173 1983    181 1954    207 1843    237 1830    295 1748    325 1694    335 1685

V026 750814 0612 2340N 13505E    17     2824      335 1651       6
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2824     37 2824     40 2798     55 2490     60 2432     79 2287    103 2169    113 2136    122 2113    148 2091
    157 2046    209 1877    240 1804    265 1779    298 1714    318 1687    335 1651

V026 750814 0633 2250N 13349E    20     2900      335 1663       7
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2900     48 2899     51 2894     60 2814     70 2706     76 2651     90 2543    109 2425    125 2347    137 2278
    148 2233    156 2184    165 2143    171 2127    184 2063    214 1958    227 1925    244 1862    280 1769    335 1663

V026 750814 0716 2151N 13251E    23     2867      334 1594       8
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2867     27 2871     37 2868     41 2863     44 2845     50 2726     57 2542     61 2468     64 2439     74 2385
     85 2278     93 2225    108 2145    126 2082    155 1987    168 1959    202 1857    207 1831    244 1729    267 1676
    287 1644    323 1612    334 1594

V026 750814 0726 2113N 13234E    16     2849      334 1658       9
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2849     34 2844     38 2829     45 2779     62 2578     76 2437     82 2401    101 2314    118 2262    132 2232
    171 2139    193 2016    204 1958    222 1901    302 1711    334 1658

V026 750814 0736 2050N 13239E    23     2860      348 1432      10
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
      0 2860     22 2862     33 2853     52 2837     56 2788     61 2741     64 2660     70 2581     75 2528     85 2454
     91 2392    116 2273    127 2230    142 2194    157 2152    169 2103    193 2047    217 1968    223 1933    269 1760
    296 1629    329 1514    348 1432
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SHIP YYMMDD HHMM LAMMH LONMMH   NC.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750814 0745 1952N 13230E      22      2893       338 1538        11
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2893      21 2893      26 2885      37 2808      44 2718      55 2595      78 2489      93 2360     107 2305     115 2276
    137 2246     174 2048     180 2001     196 1916     214 1844     234 1777     266 1688     290 1634     299 1623     305 1501
    329 1547     338 1538

V026 750814 0756 1910N 13229E      26      2904       335 1338        12
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2904      18 29.9      24 2904      31 2889      40 2844      60 2679      64 2617      72 2549      86 2454      99 2382
    105 2362     121 2353     127 2338     140 2290     157 2187     173 2107     184 2071     190 2060     281 1998     215 1891
    234 1801     247 1766     294 1549     313 1436     330 1349     335 1338

V026 750814 0815 1929N 13116E      17      2896       332 1587        13
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2896      40 2899      44 2881      53 2726      57 2706      66 2617      81 2496      96 2412     142 2257     172 2142
    186 2082     194 2058     207 1995     251 1842     283 1754     311 1664     332 1587

V026 750814 0833 2106N 13123E      25      2816       335 1539        14
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2816      34 2805      37 2794      41 2770      46 2625      55 2514      58 2443      60 2420      78 2302      90 2230
     95 2183     130 2065     140 2018     154 1995     161 1969     168 1956     181 1910    [illegible]2 1828     222 1793     235 1764
    245 1732     270 1696     297 1626     311 1600     335 1539

V026 750814 0850 2152N 13143E      22      2769       333 1511        15
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2769       4 2766       7 2787      12 2796      30 2800      33 2791      37 2753      48 2543      53 2481      66 2372
     72 2296      91 2207     108 2109     132 1993     160 1902     176 1862     195 1794     219 1758     247 1681     263 1662
    299 1599     333 1511

V026 750814 0910 2240N 13214E      20      2809       331 1626        16
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2809      29 2809      34 2790      43 2690      52 2617      61 2559      73 2495      87 2408     122 2227     139 2143
    149 2102     164 2069     172 2043     179 1992     198 1915     216 1861     238 1811     262 1775     287 1705     331 1626

V026 750814 0932 2316N 13244E      21      2862       335 1613        17
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2862      23 2862      30 2853      34 2840      37 2820      45 2657      53 2558      59 2494      77 2347     105 2218
    115 2184     122 2156     137 2067     152 2037     184 1916     225 1826     233 1799     263 1736     299 1676     315 1639
    335 1613

V026 750814 0949 2354N 13332E      19      2833       334 1648        18
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2833      23 2849      46 2856      51 2798      59 2624      63 2571      72 2508      90 2419     109 2300     123 2244
    139 2145     144 2126     153 2069     161 2041     172 1985     176 1967     225 1869     254 1766     334 1648

V026 750814 1006 2425N 13430E      24      2811       332 1673        19
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2811      22 2824      31 2840      53 2842      57 2812      67 2626      72 2566      88 2493     100 2369     111 2244
    116 2256     130 2227     141 2178     152 2116     171 2059     181 1989     198 1958     217 1892     234 1866     261 1789
    279 1751     296 1739     307 1718     332 1673
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SHIP YYMMDD HHMM LAMMH LONMMH   NC.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750814 1019 2443N 13525E      21       2851       329 1715          20
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2851      42 2853      45 2814      52 2653      56 2585      67 2438      72 2405      85 2347      93 2296     105 2239
   115 2210     125 2159     132 2128     170 2015     192 1936     203 1904     226 1851     255 1800     282 1766     310 1749
   329 1715

V026 750814 1634 2446N 13627E      19       2764       334 1609          21
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2764      34 2768      38 2748      48 2621      55 2467      58 2410      67 2344      73 2284      83 2221      96 2163
   139 2117     147 2001     171 1947     189 1919     242 1788     258 1736     275 1699     311 1654     334 1609

V026 750814 1052 2457N 13727E      20       2764       334 1557          22
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2764      32 2774      36 2758      41 2684      48 2485      54 2385      58 2346      66 2303      71 2266      97 2143
   103 2106     132 2002     170 1923     194 1835     210 1799     237 1760     244 1739     279 1688     302 1642     334 1557

V026 750815 0648 2200N 13702E      17       2804       333 1675          23
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2804      31 2808      37 2793      42 2770      46 2721      51 2611      56 2543      63 2480      73 2432      83 2434
   144 2178     161 2103     183 2052     224 1909     261 1832     286 1764     333 1675

V026 750815 0655 2222N 13700E      23       2804       334 1644          24
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2804      23 2800      28 2774      37 2610      43 2529      51 2476      60 2433      68 2363      72 2339      90 2299
    97 2273     105 2240     120 2193     134 2131     143 2079     164 1988     210 1841     225 1807     244 1793     257 1761
   283 1738     335 1732     334 1644

V026 750815 0706 2243N 13658E      23       2800       333 1680          25
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2800      39 2900      42 2789      52 2680      59 2624      73 2549      87 2458     100 2402     119 2336     126 2291
   131 2269     146 2238     152 2201     160 2182     169 2143     190 2076     194 2052     207 2001     218 1951     223 1917
   268 1757     294 1734     333 1680

V026 750815 0713 2307N 13658E      23       2813       330 1487          26
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2813      33 2813      39 2802      42 2790      45 2754      50 2556      53 2507      63 2437      76 2291      82 2245
   115 2093     123 2051     128 2028     146 1986     183 1858     196 1816     215 1787     243 1726     253 1715     267 1668
   281 1538     316 1539     330 1487

V026 750815 0720 2340N 13702E      19       2717       332 1677          27
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2717      71 2712      76 2710      82 2688      86 2637      95 2337      98 2307     139 2127     150 2097     165 2028
   179 1995     186 1959     198 1926     206 1992     231 1837     250 1820     269 1778     303 1733     332 1677

V026 750815 0730 2358N 13702E      20       2749       335 1566          28
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2747      15 2740      20 2722      26 2676      37 2344      42 2288      52 2224      64 2172      74 2144     103 2023
   162 1863     179 1830     189 1799     218 1753     234 1747     251 1722     259 1696     295 1646     310 1620     335 1566

V026 750815 0737 2424N 13703E      20       2678       335 1524          29
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2679      14 2678      21 2669      25 2650      37 2446      47 2252      51 2202      72 2101      86 2007      92 1981
   112 1926     132 1858     140 1874     186 1802     196 1768     217 1729     244 1698     291 1621     299 1597     335 1524
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SHIP YYMMDD HHMM LAMMH LCNMMH   NC.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750815 0744 2459N 13712E      18      2747       333 1486        30
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2747     10 2746     20 2729     23 2715     30 2654     35 2580     46 2153     53 2038     59 1981     63 1957
    77 1907    121 1843    137 1898    195 1744    223 1702    267 1612    301 1561    333 1486

V026 750815 0810 2535N 13709E      20      2704       315 1601        31
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2704     12 2702     21 2682     31 2648     37 2624     42 2580     45 2560     50 2489     54 2370     62 2213
    66 2152     73 2120     85 2061    133 1902    164 1834    183 1797    213 1765    237 1705    290 1624    315 1601

V026 750815 0838 2454N 13732E      22      2636       301 1595        32
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2636     10 2631     22 2614     29 2592     36 2555     43 2507     52 2409     57 2348     65 2175     69 2107
    81 2005     89 1950     97 1918    111 1880    144 1822    164 1772    186 1753    205 1719    253 1676    267 1660
   294 1650    301 1595

V026 750815 0915 2322N 13851E      19      2738       334 1579        33
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2738     28 2741     34 2724     46 2670     52 2624     61 2527     68 2378     76 2280     89 2184    106 2078
   123 2011    131 1980    145 1933    173 1831    195 1780    265 1657    277 1647    293 1616    334 1579

V026 750815 0921 2339N 13804E      16      2707       316 1616        34
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2707     35 2707     40 2679     57 2613     66 2556     83 2303     88 2234    100 2131    112 2044    119 2006
   141 1913    169 1838    186 1807    215 1773    260 1691    316 1616

V026 750815 0936 2355N 13700E      15      2669       332 1589        35
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2669     18 2669     20 2661     25 2599     41 2220     44 2193     52 2147     82 2050    121 1951    160 1877
   173 1838    207 1764    220 1756    257 1682    332 1589

V026 750815 0944 2348N 13630E      24      2716       334 1584        36
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2716     37 2730     40 2714     44 2652     50 2450     57 2332     65 2231     69 2199     79 2126     85 2094
   107 2024    137 1942    150 1913    175 1878    180 1861    208 1819    226 1793    248 1747    260 1736    277 1695
   291 1679    301 1661    323 1600    334 1584

V026 750815 0952 2343N 13600E      18      2800       333 1664        37
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2800     49 2805     51 2793     56 2653     61 2593     76 2445     86 2366    110 2218    117 2160    129 2085
   145 2035    211 1853    241 1813    263 1783    282 1770    307 1701    318 1676    333 1664

V026 750815 1005 2340N 13510E      22      2813       335 1676        38
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2813     31 2813     33 2796     41 2581     45 2516     60 2444     70 2378     97 2224    119 2161    145 2108
   165 2057    169 2037    173 2002    179 1968    191 1939    198 1900    203 1882    213 1968    227 1827    259 1776
   302 1740    335 1676

V026 750815 1031 2249N 13349E      18      2869       335 1646        39
  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP  DEPTH TEMP
     0 2869     40 2873     43 2856     51 2723     53 2697     70 2579     80 2494     88 2400    132 2209    147 2133
   154 2101    165 2073    187 1969    198 1927    241 1806    283 1732    296 1693    335 1646
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SHIP YYMMDD HHMM LAMMH LONMMH   NO.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750815 1045 2345N 13335E       21       2849       334 1715       40
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2849      44 2861      47 2855      50 2839      59 2729      68 2648      75 2610      89 2509      99 2460     105 2438
   118 2431     122 2418     145 2284     164 2146     173 2108     185 2083     199 2026     227 1955     251 1888     286 1791
   334 1715

V026 750815 1059 2424N 13426E       20       2816       334 1640       41
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2816      38 2822      42 2799      48 2737      53 2611      61 2497      78 2398      80 2329      90 2267     105 2211
   108 2189     129 2114     140 2056     169 1980     195 1919     209 1871     246 1789     255 1760     324 1660     334 1640

V026 750815 1119 2417N 13536E       21       2791       323 1664       42
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2791      32 2849      37 2809      40 2798      42 2664      48 2549      55 2448      65 2364      81 2273      95 2286
   117 2127     155 2017     165 1980     182 1934     195 1912     223 1817     242 1796     264 1733     285 1694     306 1669
   323 1664

V026 750815 1125 2351N 13535E       25       2800       333 1653       43
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2800      34 2921      45 2816      50 2769      55 2693      58 2599      61 2538      67 2469      77 2390     106 2226
   127 2122     141 2070     154 2035     192 1906     213 1872     220 1850     231 1839     238 1815     243 1813     249 1793
   266 1740     291 1745     299 1719     303 1719     333 1653

V026 750815 1138 2319N 13538E       25       2836       334 1616       44
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2836      26 2835      29 2850      47 2852      49 2848      55 2805      67 2611      76 2534      82 2490     107 2332
   130 2220     141 2146     148 2115     169 2052     176 2029     190 1955     199 1917     211 1879     225 1848     243 1831
   265 1784     275 1777     288 1757     315 1694     334 1616

V026 750815 1145 2250N 13538E       19       2956       334 1878       45
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2956      20 2989      42 3010      54 3010      64 2975      68 2954      75 2880      83 2832      97 2767     118 2640
   130 2586     164 2478     175 2439     203 2283     210 2248     235 2158     286 1994     317 1926     334 1878

V026 750815 1151 2225N 13538E       18       2798       334 1742       46
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2798      32 2816      40 2816      51 2700      59 2638      66 2594      94 2493     101 2453     112 2411     139 2340
   167 2300     175 2283     188 2239     206 2153     227 2022     245 1973     263 1909     334 1742

V026 750817 0257 2200N 13700E       19       2793       335 1652       47
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2793      46 2793      50 2769      55 2708      67 2604      85 2489      97 2440     109 2368     143 2243     153 2196
   155 2173     171 2097     187 2046     191 2022     213 1936     251 1832     299 1731     308 1719     335 1652

V026 750817 0304 2225N 13700E       17       2809       333 1672       48
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2809      56 2813      59 2789      72 2636      75 2609      93 2546     119 2398     135 2326     144 2269     164 2180
   171 2131     190 2067     203 2004     249 1869     272 1832     298 1748     333 1672

V026 750817 0320 2244N 13700E       17       2805       335 1687       49
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
     0 2805      46 2811      49 2803      62 2668      71 2615      88 2530     103 2427     122 2311     148 2203     172 2131
   191 2060     197 2032     208 1988     230 1915     271 1833     322 1710     335 1687
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SHIP YYMMDD HHMM LAMMH LONMMH    NC.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750817 0326 2308N 13700E      16      2762         335 1588          59
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2762      48 2767      50 2747      58 2608      61 2560      76 2432      98 2265     122 2138     154 2064     168 2013
    222 1852     294 1690     298 1687     306 1676     321 1607     335 1588

V026 750817 0351 2401N 13741E      23      2738         335 1578          51
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2738      23 2737      30 2722      36 2673      53 2595      56 2572      60 2520      64 2395      71 2282      76 2234
     85 2194      99 2147     126 2045     137 2023     142 1995     169 1897     189 1854     199 1822     213 1805     262 1695
    291 1651     313 1630     335 1578

V026 750817 0358 2423N 13701E      19      2733         335 1507          52
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2733      34 2731      40 2704      47 2673      54 2617      59 2556      67 2411      75 2313      91 2189     115 2071
    143 1963     169 1889     194 1839     205 1803     267 1656     280 1641     292 1612     304 1602     335 1507

V026 750817 0429 2455N 13733E      18      2644         334 1524          53
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2644      34 2616      45 2593      58 2534      65 2512      72 2470      75 2439      82 2207      91 2078      95 2027
    109 1946     115 1915     138 1843     155 1798     216 1711     257 1674     311 1580     334 1524

V026 750817 0442 2536N 13711E      19      2640         335 1591          54
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2640      29 2640      36 2622      49 2577      56 2544      63 2501      67 2462      83 2228      86 2192      91 2158
    106 2078     128 1983     159 1892     165 1866     196 1806     222 1789     242 1746     307 1656     335 1591

V026 750817 0543 2425N 13423E      25      2822         335 1596          55
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2822      26 2820      33 2814      40 2789      45 2731      56 2489      62 2412      73 2374      78 2356      84 2301
     86 2266      94 2218     108 2156     111 2148     123 2089     135 2047     138 2024     151 1974     192 1869     203 1843
    211 1840     247 1760     285 1693     302 1676     335 1596

V026 750817 0603 2345N 13337E      16      2833         333 1685          56
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2833      48 2835      53 2812      61 2700      83 2534     109 2389     118 2320     143 2180     169 2085     191 2020
    199 2010     231 1921     242 1878     269 1806     322 1695     333 1685

V026 750817 0619 2249N 13351E      17      2811         335 1642          57
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2811      42 2811      49 2761      53 2659      57 2620      72 2507      82 2442      92 2396     111 2288     128 2211
    150 2091     176 1977     193 1919     223 1848     247 1809     293 1713     335 1642

V026 750817 0641 2345N 13505E      19      2804         334 1657          58
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2804      41 2810      48 2715      55 2674      60 2612      65 2500      69 2470      91 2335     125 2169     135 2126
    159 2053     175 1994     203 1931     210 1908     222 1885     255 1788     269 1752     312 1678     334 1657

V026 750817 0654 2340N 13602E      17      2809         333 1694          59
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2809      51 2808      59 2613      64 2554      84 2410      92 2333      97 2296     114 2207     120 2179     143 2104
    223 1835     263 1810     281 1806     297 1766     308 1751     324 1702     333 1694
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SHIP YYMMDD HHMM LAMMH LCNMMH   AC.PR SURF.TEMP MAX DEPTH TEMP PRINT COUNT
V026 750817 0700 2346N 13630E      19      2776        335 1589        60
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2776      37 2773      42 2769      48 2734      53 2687      63 2511      79 2422      80 2320      87 2269     103 2207
    115 2142     163 1976     172 1933     212 1836     262 1730     278 1709     294 1679     324 1606     335 1589

V026 750817 0708 2345N 13659E      20      2738        336 1600        61
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2738      42 2738      46 2724      53 2661      67 2390      71 2331      80 2251      89 2199     105 2122     146 2009
    157 1979     169 1939     194 1871     223 1813     242 1763     261 1721     283 1700     298 1678     320 1607     336 1600

V026 750817 0717 2343N 13717E      17      2682        335 1539        62
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2682      31 2682      37 2613      46 2500      52 2390      56 2339      62 2392     105 2116     123 2067     135 1933
    152 1944     197 1843     230 1790     241 1759     258 1734     306 1622     335 1538

V026 750817 0724 2338N 13805E      23      2704        334 1599        63
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2704      43 2706      49 2674      66 2606      77 2531      94 2462      99 2256     103 2216     108 2192     116 2134
    128 2071     140 2025     144 1996     159 1959     167 1928     183 1901     207 1831     247 1773     272 1720     281 1711
    308 1658     319 1624     334 1599

V026 750817 0731 2338N 13825E      22      2618        335 1578        64
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2618      15 2618      31 2600      39 2586      56 2523      64 2479      68 2444      72 2377      79 2288      85 2214
     92 2167     119 2044     136 1982     139 1946     149 1908     170 1950     196 1802     212 1787     234 1742     257 1722
    309 1632     335 1578

V026 750817 0737 2340N 13838E      22      2727        335 1536        65
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2727      26 2724      37 2682      45 2624      51 2562      65 2266      72 2202      85 2116      92 2071     110 1992
    122 1961     137 1893     160 1826     167 1811     179 1804     194 1783     204 1757     217 1742     234 1708     282 1622
    314 1584     335 1536

V026 750817 0759 2320N 13851E      20      2751        341 1572        66
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2751      27 2752      32 2728      37 2690      52 2539      65 2364      68 2281      71 2251      82 2173     100 2076
    120 1990     138 1940     154 1907     167 1864     181 1830     210 1791     242 1728     293 1653     333 1573     341 1572

V026 750817 0811 2236N 13910E      24      2740        334 1593        67
  DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP   DEPTH TEMP
      0 2740      11 2736      22 2747      44 2749      57 2696      64 2659      69 2609      77 2424      84 2309      90 2252
     99 2198     107 2160     127 2096     138 2041     165 1939     185 1891     207 1808     221 1789     234 1757     253 1727
    262 1722     296 1667     307 1627     334 1593
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